

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Joseph J. Nahas Group Art Unit:
Application No.: Examiner:
Date Filed: Concurrently Herewith
Title: MAGNETORESISTIVE RANDOM ACCESS MEMORY SIMULATION

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner For Patents
Alexandria, VA 22313

SIR:

In accordance with 37 C.F.R. §1.56 and in compliance with 37 C.F.R. §§1.97 and 1.98, the references listed on attached Form PTO/SB/08 and/or subsequently identified herein, are for consideration by the United States Patent and Trademark Office. Pursuant to the Office waiving the requirement under 37 CFR 1.98 (a)(2)(i) for submitting a copy of each cited U.S. patent and each U.S. patent application publication for all U.S. national patent applications filed after June 30, 2003 and for all international applications that have entered the national stage under 35 USC §371 after June 30, 2003, copies of the reference are not submitted herewith.

I. COPIES

- a. ☒ A legible copy of (i) each U.S. and foreign patents; (ii) each publication or that portion which caused it to be listed; and (iii) all other information or that portion which caused it to be listed, is included herewith.
- b. ☐ Any patents, publications or other information which are listed on PTO/SB/08 which are not enclosed herewith were previously cited by or submitted to the PTO in one of the following applications which has been relied upon for an earlier filing date under 35 U.S.C. §120:

U.S. Serial Number

U.S. Filing Date

II. CONCISE EXPLANATION OF THE RELEVANCE (check at least one box)

- a. ☒ Except as may be indicated below in (b) of this section, all of the patents, publications or other information are in the English language (concise explanation not required).
- b. ☐ A concise explanation of the relevance of all patents, publications or other information listed that is not in the English language is as follows:
- c. ☐ The following additional information is provided for the Examiner's consideration:

III. ☐ CROSS REFERENCE TO RELATED APPLICATION(S)

The Examiner is advised that the following co-pending application(s) contain(s) subject matter that may be related to the present application. By bringing this (these) applications to the Examiner's attention, Applicant(s) does(do) not waive the confidentiality provisions of 35 U.S.C. §122.

Serial No.

Filing Date

Art Unit

FEES

IV. ☒ THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(b): (check one box)

- a. ☒ within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d) (37 C.F.R. §1.97(b)(1)). No fee or statement is required.
- b. ☐ within three months of the date of entry of the national stage as set forth in § 1.491 in an international application (37 C.F.R. §1.97(b)(2)). No fee or statement is required.
- c. ☐ before the mailing date of a first Office Action on the merits (37 C.F.R. §1.97(b)(3)). No fee or statement is required.
- d. ☐ before the mailing date of a first Office Action after the filing of a request for continued examination under § 1.114 (37 C.F.R. § 1.97(b)(4)). No fee or statement is required.

- V. ☐ THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(c): (check one box)
before the mailing date of any of a Final Office Action under 37 C.F.R. §1.113, a Notice of Allowance under 37 C.F.R. §1.311, or an action that otherwise closes prosecution in the application (See 37 C.F.R. §1.97(c)).
- a. ☐ No statement; therefore, charge deposit account **502117** the fee set forth in 37 C.F.R. §1.17(p).
b. ☐ See the statement below. No fee is required.

- VI. ☐ THIS IDS IS BEING FILED UNDER 37 C.F.R. §1.97(d):
on or before payment of the issue fee and is accompanied by the following:
- 1) a statement under 37 C.F.R. §1.97(e) as provided below; and
2) charge deposit account **502117** the petition fee set forth in §1.17(p).

- VII. ☐ STATEMENT UNDER 37 C.F.R. §1.97(e) (check only one box, if applicable)
The undersigned hereby states that
- a. ☐ each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of IDS; or
b. ☐ no item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application, and to knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement, or
c. ☐ some of the items of information contained in the IDS were cited in a communication from a foreign Patent Office. As to this information, the undersigned states that each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby states that no item of this remaining information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application or, to the knowledge of the person signing the statement after making reasonable inquiry, no item of information contained in the IDS was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of this statement.

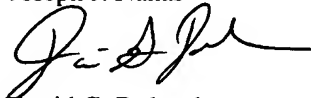
VIII. PAYMENT OF FEES

- ☐ A check in the amount of _____ is enclosed for the above-identified fee(s).
☐ Please charge Deposit Account **502117** in the amount of \$180.00 for the above-indicated fee(s).
☒ If Applicant has overlooked any additional fees, or if any overpayment has been made, the Commissioner is hereby authorized to credit or debit Deposit Account **502117**.
☐ Two Copies of this paper are attached for Deposit Account charges and debits.

The above references are being cited only in the interests of candor and without any admission that they constitute statutory prior art or contain matter which anticipates the invention or which would render the same obvious, either singly or in a combination, to a person of ordinary skill in the art.

If the Examiner has any questions concerning this IDS, he/she is requested to contact the undersigned. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule (with a petition if necessary) and charge the appropriate fee to Deposit Account No. **502117**.

Respectfully submitted,
Joseph J. Nahas



David G. Dolezal
Attorney for Applicant(s)
Reg. No. 41,711
Tel. 512.996.6839

MOTOROLA, INC.
Customer Number 23125

Enclosures: ☒ PTO/SB/08
☒ References
☐ Foreign Search Report
☐ Other:

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				<i>Complete if Known</i>	
				Application Number	
				Filing Date	Concurrently Herewith
				First Named Inventor	Joseph J. Nahas
				Group Art Unit	
Examiner Name					
Sheet 1 of 1	Attorney Docket Number SC13159TC				

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number Number -Kind Code ² (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AA	5,867,405	02/02/1999	Jiang <i>et al.</i>	
	AB	2002/0141232 A1	10/03/2002	Saito <i>et al.</i>	
	AO	6,545,906 B1	04/08/2003	Savtchenko <i>et al.</i>	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document Country Code ³ Number ⁴ Kind Code ² (if known)		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	AC	Bae <i>et al.</i> , "Fabrication and Thermal-Chemical Stability of Magnetoresistive Random-Access Memory Cells Using α -Fe ₂ O ₃ Bottom Spin Values," <i>IEEE Transactions on Magnetism</i> , Vol. 37, No. 6, November 2001, pp. 3960-3968.	
	AD	Cheung, "Direct Charging' Charge Device Model Testing of Magnetoresistive Recording Heads," <i>EOS/ESD Symposium</i> 97-398, 1997, pp. 398-404.	
	AE	M. Durlam, <i>et al.</i> , "A Low Power 1Mbit MRAM Based on 1T1MTJ Bit Cell Integrated with Copper Interconnects," <i>Symposium on VLSI Circuits Digest of Technical Papers</i> , 2002, pp. 158-161.	
	AF	B. A. Everitt <i>et al.</i> , "Single-Domain Model for Pseudo Spin Valve MRAM Cells," <i>IEEE Transactions on Magnetism</i> , September 1997, p. 3289-3291, Vol. 33, No. 5.	
	AG	P. K. George <i>et al.</i> , "Head Parameter Sensitivity Study of the Intrinsic Field Reversal Time," <i>Journal of Applied Physics</i> , April 15, 1999, p. 4979-4981, Vol. 85, No. 8.	
	AH	J. Mahdavi <i>et al.</i> , "Dynamic Modeling of Non-Linear SRM Drive with PSPICE," <i>IEEE Industry Applications Society Annual Meeting</i> , New Orleans, Louisiana, October 5-9, 1997, pp. 661-667.	
	AI	A. Maxim <i>et al.</i> , "A New Analog Behavioral SPICE Macromodel of Magnetic Components," <i>IEEE International Symposium on Industrial Electronics</i> , Guimarães, Portugal, University of Minho, July 7-11, 1997, pp. 183-188, Vol. 2 of 3.	
	AJ	A. Maxim <i>et al.</i> , "A Novel Behavioral Method of SPICE Macromodeling of Magnetic Components Including the Temperature and Frequency Dependencies," <i>IEEE Power Electronics Conference</i> , 1998, pp. 393-399.	
	AK	T. Sugawara <i>et al.</i> , "A Nonlinear Model for Magnetic Recording Channel with an MR Head," <i>IEEE Transactions on Magnetism</i> , January 1998, p. 57-62, Vol. 34, No. 1.	
	AL	A. Wallash, "Field-Induced Charged Device Model Testing of Magnetoresistive Recording Heads," <i>EOS/ESD Symposium</i> , 1996, pp. 8-13.	
	AM	A. Wallash <i>et al.</i> , "ESD Evaluation of Tunneling Magnetoresistive (TMR) Devices," <i>EOS/ESD Symposium</i> , 2000, pp. 470-474.	
	AN	U.S. Patent Application 10/302,203 filed November 22, 2002, entitled "Method and Apparatus for Simulating a Magnetoresistive Random Access Memory (MRAM)", assignee same as assignee hereof.	

Examiner Signature	Date Considered
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EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation, if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English Language Translation is attached.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.